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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of

Docket No: Q61520

Nobuhiko TSUDA, et al.

Appln. No.: 09/674,249

Group Art Unit: 1711

Confirmation No.: 5228

Examiner: Duc Truong

Filed: October 02, 2001

For: FLUORINE-CONTAINING COPOLYMER HAVING FUNCTIONAL GROUP

SUBMISSION OF APPEAL BRIEF

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

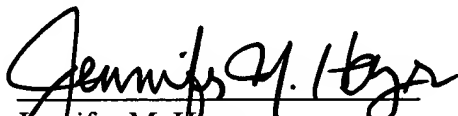
P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Submitted herewith please find an Appeal Brief. A check for the statutory fee of \$330.00 is attached. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account. A duplicate copy of this paper is attached.

Respectfully submitted,


Jennifer M. Hayes
Registration No. 40,641

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

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Date: September 15, 2004



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APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

I. REAL PARTY IN INTEREST

The real party in interest is Daikin Industries, Ltd., of Osaka, Japan.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative, and the Assignees of this application are not aware of any other appeals or interferences which will directly affect or be affected by or have a bearing on the Board's decision in the pending appeal.

APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Appln. No.: 09/674,249

Attorney Docket No. Q61520

III. STATUS OF CLAIMS

Claims 1-10 are pending in the application.

Claims 1-10 are rejected.

This is an appeal from the Examiner's rejection of claims 1-10.

IV. STATUS OF AMENDMENTS

An Amendment Under 37 C.F.R. § 1.116 was filed prior to the filing of this Appeal Brief on September 13, 2004, to correct a minor error in claim 4 by replacing the phrase “hydrocarbon ether vinyl” with the phrase “hydrocarbon vinyl ether”. This Amendment has not yet been considered by the Examiner. However, since the Amendment merely places the claims in better condition for appeal in accordance with 37 C.F.R. § 1.116(b)(2), which became effective on September 13, 2004, Appellants presume that the Amendment will be entered.

The Amendment filed under 37 C.F.R. § 1.116, on October 24, 2003, has been entered in view of the Request for Continued Examination (RCE) and fee filed therewith.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

The present invention relates to a fluorine-containing copolymer having functional group, which is excellent in chemical resistance, solvent resistance, water resistance, weather resistance, stain-proofing property, adhesion and the like. The fluorine-containing copolymer of the present invention is useful as a laminating film and a co-extruded layered tube, etc. Specification, page 1, lines 7-12.

Fluorine-containing copolymers comprising a vinyl monomer unit having a hydrocarbon type functional group are known to be useful as crosslinking coating resins when used in combination with a curing agent. Fluorine-containing copolymers prepared by copolymerizing perfluorobutenoic acid or a vinyl ether having a fluorine-based functional group are also known as fluorine-containing copolymers comprising a fluorine-containing vinyl monomer. Specification, page 1, lines 15-22.

However, a fluorine-containing resin copolymer that comprises a vinyl monomer unit having a hydrocarbon type functional group and which is substantially insoluble in tetrahydrofuran (THF) has not been known. Prior to the discovery of the present inventors, in the case of a resin soluble in THF, it was essential to employ a curing agent capable of forming a crosslinked structure in combination with the copolymer in order to achieve solvent resistance. On the other hand, when using the copolymer in combination with a curing agent for the intended use of a molding material, it was necessary to control the molding and curing reaction in a very narrow temperature range. Thus, heat-molding of the resin was very difficult.

Further, since a monomer having a fluorine-based functional group has good reactivity with a fluoroolefin such as tetrafluoroethylene (TFE), it can introduce a functional group into a melt-moldable resin that is insoluble in THF, such as ethylene-tetrafluoroethylene copolymer (ETFE), tetrafluoroethylene/hexafluoropropylene copolymer (FEP) and tetrafluoroethylene/perfluoro(vinyl ether) copolymer (PFA). However, the process for preparing the monomer requires many stages and is economically disadvantageous. Specification, page 2, lines 6-13.

The present inventors have found that a hydrocarbon vinyl compound monomer having functional group, particularly a vinyl ether monomer having functional group reacts with a copolymer containing a specific amount of TFE monomers and provides a resin that is insoluble in THF. Based on these findings the present invention was achieved. Specification, page 2, lines 14-18.

The present invention is primarily defined by two independent claims on appeal, namely claim 1 and claim 5. Claim 1 provides a fluorine-containing resinous copolymer having functional group, characterized in that the copolymer is crosslinkable, contains a hydrocarbon vinyl ether compound unit having functional group and tetrafluoroethylene unit, has a fluorine content of not less than 10% by weight and is insoluble in THF substantially. The specification, page 2, lines 21-26; page 2, line 27 and page 3, line 15.

Claim 5 provides a resin composition comprising a crosslinkable fluorine-containing resinous copolymer having functional group and a curing agent that is reactive with the functional group of the copolymer, wherein the copolymer contains a hydrocarbon vinyl ether

compound having functional group and tetrafluoroethylene unit, has a fluorine content of not less than 10% by weight and is insoluble in THF substantially. The specification, page 8, line 2 to page 10, line 6.

As recited in claims 2 and 6 depending from claims 1 and 5, respectively, the melting point of the copolymer is not more than 160°C. The specification, page 6, lines 13-15. As recited in claims 3 and 7 depending from claims 1 and 5, respectively, the copolymer contains tetrafluoroethylene unit, hexafluoropropylene and ethylene unit as essential components. The specification, page 7, line 26 - page 8, line 1. As recited in claims 4 and 8 depending from claims 1 and 5, respectively, the hydrocarbon vinyl ether compound unit is hydroxybutyl vinyl ether unit or glycidyl vinyl ether unit. The specification, page 5, lines 13-16. As recited in claim 9 depending from claim 5, the composition is a resin composition for molding. The specification, page 6, lines 21-23. As recited in claim 10, depending from claim 5, the composition is a resin composition for coating. The specification, page 9, line 20 - page 10, line 1.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. U.S. Patent No. 3,449,434 to Stilmar et al

Claims 1-10 are rejected under 35 U.S.C. § 103(b) as being anticipated, or in the alternative, as being unpatentable over U.S. Patent 3,449,434 to Stilmar et al. The following are the Examiner's grounds for rejection.

1. In the Office Action dated March 19, 2003, as the ground for rejection of claims 1-4, the Examiner cited Stilmar et al as disclosing fluorine-containing copolymers derived from tetrafluoroethylene and vinyl esters having a fluorine content of 60%, which are insoluble in organic solvents. Although acknowledging that Stilmar et al does not disclose the claimed melting point (as recited in claim 2), the Examiner considered such to be inherent in the prior art composition.

2. In the Office Action dated November 28, 2003, the rejection over Stilmar et al under 35 U.S.C. § 102(b), or in the alternative under 35 U.S.C. § 103(a), was applied to claims 1-10 (new claims 5-10 were added in the Amendment filed on October 24, 2003), essentially for reasons of record set forth above. Additionally, the Examiner considered that use of the crosslinked composition of claim 5 of the present application for molding and coating is taught by Stilmar et al at column 1, lines 34-36.

B. EP Patent Application No. 0481478 (EP '478)

Claims 1-10 are rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, as being unpatentable under 35 U.S.C. § 103(a) over EP '478. The following are the Examiner's grounds for rejection.

1. As the grounds for rejection with respect to claims 1-4, in the Office Action dated March 19, 2003, the Examiner cited Comparative Example 5, EP '478 as disclosing a copolymer comprising tetrafluorethylene and hydroxybutyl vinyl ether, which is completely insoluble in THF and which has a fluorine content of not less than 10% by weight. The Examiner further considered the claimed melting point (as recited in claim 2 of the present application) to be inherent in the prior art composition.

2. As for the grounds for rejection with respect to claims 5-10 (added in the Amendment filed on October 24, 2003), in the Office Action dated November 28, 2003, the Examiner was of the view that in the presence of a curing agent, the fluorine containing resinous copolymer is necessarily crosslinked. Further, the Examiner considered that crosslinking in the comparative Examples of EP '478 is carried out with a curing agent, because the reference discloses the use of azobisisobutyronitrile and methyl vinyl ether.

3. In maintaining the rejection over EP '478 in the final Office Action dated April 15, 2004, the Examiner did not accord patentable weight to certain terms describing the characteristics of the claimed composition such as "resinous" and "crosslinkable". Further, the Examiner considered that the present claims do not define over the disclosure of EP '478 in which hydroxybutyl vinyl ether, methyl vinyl ether and TFE are polymerized as opposed to being crosslinked because the claims do not require any crosslinked components. Thus, the Examiner takes the position that the arguments are not commensurate in scope with the claims. The Examiner also inquires as to how the relationship between crosslinking characteristics and solubility is determined.

VII. ARGUMENTS

A. The Claims Do Not Stand And Fall Together

The claims do not stand and fall together for the reasons set forth herein. The claims can be grouped into four groups: (1) claims 1-2 and 4; (2) claim 3; (3) claims 5-6 and 8-10; and (4) claim 7.

Claims 1-2 and 4 are directed to a fluorine-containing resinous copolymer having functional group, which (1) is crosslinkable; (2) contains a hydrocarbon vinyl ether compound unit having functional group; (3) contains a tetrafluoroethylene unit; (4) has a fluorine content of not less than 10% by weight; and (5) is substantially insoluble in tetrahydrofuran, based on the elements recited in independent claim 1.

Claim 3 is directed to a fluorine-containing resinous copolymer having functional group as recited in independent claim 1 and further requires that the copolymer contains tetrafluoroethylene unit, hexafluoropropylene unit and ethylene unit as essential components. Thus, the copolymer of claim 3 requires a hexafluoropropylene unit and ethylene unit in addition to tetrafluoroethylene unit of the copolymer recited in independent claim 1, which is not required for the invention of claim 1 and therefore claim 3 is separately patentable from claims 1-2 and 4 for at least this reason.

Claims 5-6 and 8-10 are directed to a resin composition comprising (A) a crosslinkable fluorine-containing resinous copolymer having functional group, which (1) is crosslinkable, (2) contains a hydrocarbon vinyl ether compound unit having functional group, (3) contains a tetrafluoroethylene unit, (4) has a fluorine content of not less than 10% by weight, and (5) is

substantially insoluble in tetrahydrofuran; and (B) a curing agent that is reactive with the functional group of the copolymer. Thus, claims 5-6 and 8-10 recite an additional element that is not recited in claims 1-2 and 4, i.e., element (B), a curing agent that is reactive with the functional group of the fluorine-containing resinous copolymer. Thus the composition comprising a combination of a fluorine-containing resinous copolymer having functional group and a curing agent that is reactive with the functional group of the copolymer is separately patentable from the fluorine-containing resinous copolymer of claims 1-2 and 4 based on at least element (B).

Claim 3 is separately patentable from claims 5-6 and 8-10 based on at least the additional essential hexafluoropropylene unit and ethylene unit recited in claim 3, which is not required by claims 5-6 and 8-10 and element (B) of claims 5-6 and 8-10, which is not required by claim 3.

Claim 7 is directed to a resin composition comprising (A) a crosslinkable fluorine-containing resinous copolymer having functional group which (1) is crosslinkable, (2) contains a hydrocarbon vinyl ether compound unit having functional group, (3) contains a tetrafluoroethylene unit, (4) has a fluorine content of not less than 10% by weight, and (5) is substantially insoluble in tetrahydrofuran; and (B) a curing agent that is reactive with the functional group of the copolymer, as recited in independent claim 5. Claim 7 further requires that the copolymer contains tetrafluoroethylene unit, hexafluoropropylene unit and ethylene unit as essential components. Thus, the copolymer of claim 7 requires a hexafluoropropylene unit and ethylene unit in addition to tetrafluoroethylene unit of the copolymer recited in independent

claim 1, which is not required for the invention of claim 1, and therefore claim 3 is separately patentable from claims 1-2 and 4 for at least this reason.

Claim 7 is separately patentable from claims 5-6 and 8-10 based on at least the additional essential hexafluoropropylene unit and ethylene unit recited in claim 7, which is not required by claims 5-6 and 8-10.

Claim 7 is separately patentable from claims 1-2 and 4 based on at least the additional essential hexafluoropropylene unit and ethylene unit recited in claim 7, which is not required by in claims 1-2 and 4 and element (B) recited in claim 7, which is not required by claims 1-2 and 4.

Claim 7 is separately patentable from claim 3 at least based on element (B), which is not required by claim 3.

B. Stilmar et al does not does not anticipate nor render obvious the invention set forth in independent claims 1 and 5 of the present application, nor dependent claims 3 and 7.

Claims 1-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, as being unpatentable under 35 U.S.C. § 103(a) over Stilmar et al.

(i) Reason for Rejection

In the Office Action dated March 19, 2003, the Examiner cited Stilmar et al as disclosing fluorine-containing copolymers derived from tetrafluoroethylene and vinyl esters having a fluorine content of 60%, which are insoluble in organic solvents. Although acknowledging that Stilmar et al does not disclose the claimed melting point (as recited in claim 2), the Examiner considered such to be inherent in the prior art composition.

(ii) **Appellants' Position**

- a. **There is no disclosure of claimed “hydrocarbon vinyl ether repeating unit” in Stilmar et al, and therefore Stilmar et al cannot be said to anticipate the claimed invention.**

In the Amendment filed on June 18, 2003, Appellants traversed the rejection by pointing out that the monomers introducing a functional group into the polymer disclosed by Stilmar et al are ethyleneically unsaturated mono- and dicarboxylic acids having from 3 to 11 carbon atoms such as acrylic acid, itaconic acid, undecylenic acid or salts or anhydrides thereof, (see claim 1 and Example 8 of Stilmar et al) which are not a “hydrocarbon vinyl ether compound unit having functional group” as required by claim 1. Therefore, Stilmar et al does not disclose each and every element of claims 1-4 of the present application and therefore does not anticipate claims 1-4.

In addition, Stilmar et al does not disclose each and every element of claim 3 which requires the copolymer to contain a tetrafluoroethylene unit, hexafluoropropylene unit and ethylene unit as essential components. Further, the Examiner has not provided a reasonable factual or technical basis for asserting that the disclosed copolymers of Stilmar et al possess all components of the copolymer of claim 3. Thus, Stilmar et al also does not anticipate claim 3 for this additional reason.

- b. **Stilmar et al does not teach or suggest all elements of the claims and therefore does not render obvious the claimed invention.**

With respect to the alternative rejection under 35 U.S.C. § 103(a), Appellants further pointed out that in the present invention, the hydrocarbon vinyl ether compound reacts with a

fluorolefin, such as tetrafluorethylene, to readily obtain a copolymer that is substantially insoluble in THF. See page 2, lines 15-18 and page 5, lines 21-23 of the specification of the present application. Further, Appellants pointed out the merits of insolubility in THF as described on page 4, lines 3-17 of the specification. See paragraphs 2 and 3 on page 4 of the Amendment filed on June 18, 2003. Specifically, Appellants' specification describes that insolubility in THF means that the copolymer of the present invention has excellent solvent resistance, which provides an advantage over the prior art. More particularly, in the case where known resins that are soluble in THF were intended to be used in providing a molding material in the prior art, it was necessary to combine a curing agent capable of forming a crosslinked structure with the known resins (soluble in THF) and to control the molding and curing reaction in a very narrow temperature range in order to achieve suitable solvent resistance. See page 1, line 23 to page 2, line 5 of the specification of the present application. Namely, the hydrocarbon vinyl ether compound unit having functional group is an important feature of the invention, as it contributes to crosslinking by the functional group of the fluorine-containing resinous copolymer having functional group, thus to obtain the copolymer of the present invention, which is insoluble in THF substantially and is crosslinkable, i.e., not yet crosslinked, as recited in claims 1-4 of the application.

Subsequently, in the Amendment filed on October 24, 2003, claim 1 was amended to recite that the fluorine-containing resinous copolymer having functional group is crosslinkable. Claims 5-10 were also added as new claims reciting a resin composition comprising the fluorine-containing resinous copolymer having functional group (as in claim 1) and a curing agent that is

reactive with the functional group of the copolymer. Thus, since independent claim 5 requires a hydrocarbon vinyl ether compound unit having functional group as recited in independent claim 1, claim 5 is neither anticipated nor obvious over Stilmar et al for at least the same reasons as claim 1 as discussed above.

Claim 7 additionally requires the copolymer of the present invention to contain a tetrafluoroethylene unit, hexapropylene unit and ethylene unit as essential elements, which is neither disclosed nor reasonably suggested by Stilmar et al.

Therefore, Stilmar et al does not anticipate nor render obvious the presently claimed invention. Accordingly, Appellants respectfully submit that the rejection over Stilmar et al under 35 U.S.C. § 102(b) or in the alternative under 35 U.S.C. § 103(a) should be reversed.

C. The rejection over Stilmar et al is in error and should be reversed.

In the Office Action dated on July 24, 2003, subsequent to the Amendment filed on June 18, 2003, the rejection under 35 U.S.C. § 102(b), or in the alternative under 35 U.S.C. § 103(a) over Stilmar et al was withdrawn.

In the Office Action dated November 28, 2003, the rejection over Stilmar et al under 35 U.S.C. § 102(b), or in the alternative under 35 U.S.C. § 103(a), was raised again and applied to claims 1-10 (new claims 5-10 were added in the Amendment filed on October 24, 2003), essentially for reasons of record. Additionally, the Examiner considered that use of the crosslinked composition of claim 5 of the present application for molding and coating is taught by Stilmar et al at column 1, lines 34-36. However, as pointed out by Appellants in the Response filed on February 27, 2004, Stilmar et al does not disclose, teach or suggest a

hydrocarbon vinyl ether compound unit having a functional group as required by independent claims 1 and 5. Thus, for the reasons of record and for the reasons discussed above, Stilmar et al neither anticipates nor renders obvious the presently claimed invention.

Further, the rejection is improper since this last point (no disclosure of a hydrocarbon vinyl ether unit having a functional group) was not addressed by the Examiner in maintaining the rejection over Stilmar et al, and therefore the Examiner has not provided a reasonable basis for maintaining and/or reinstituting the rejection over Stilmar et al. Even further, the Examiner has not explained how Stilmar et al anticipates or renders obvious claims 3 and 7, which require the copolymer to further contain hexafluoropropylene unit and ethylene unit as essential components. Accordingly, the rejection should be reversed.

D. (EP '478) does not anticipate nor render obvious the invention set forth in independent claims 1 and 5 of the present application, nor dependent claims 3 and 7.

Claims 1-10 stand rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, as being unpatentable under 35 U.S.C. § 103(a) over EP '478.

(i) Reason for Rejection

With respect to claims 1-4, in the Office Action dated March 19, 2003, the Examiner cited Comparative Example 5, EP '478 as disclosing a copolymer comprising tetrafluoroethylene and hydroxybutyl vinyl ether, which is completely insoluble in THF and which has a fluorine content of not less than 10% by weight. The Examiner further considered the claimed melting point (as recited in claim 2 of the present application) to be inherent in the prior art composition.

(ii) **Appellants' Position**

1. **EP '478 does not disclose a resinous, crosslinkable copolymer insoluble in THF and therefore does not anticipate the claimed invention.**

a. **Claims 1, 2 and 4**

In the amendment filed June 18, 2003, claim 1 was amended to characterize the fluorine-containing copolymer having functional group as being a “resinous” copolymer. Further, Appellants pointed out that the dry copolymer in the Comparative Example of EP '478 which is insoluble in THF before polymerization is crosslinked, and therefore is not “crosslinkable”. This distinction is important since the copolymer of the presently claimed invention has the property of being capable of being crosslinked, while also being insoluble in tetrahydrocarbon substantially, but is not yet crosslinked.

The rejection of claims 1-4 over EP '478 was maintained in the Office Action dated July 24, 2004, essentially for reasons of record. Further, the Examiner did not consider Appellants' argument that the copolymer of the Comparative Example of EP '478 is a crosslinked polymer to be persuasive as not being commensurate in scope with the claims.

In the Amendment filed on October 24, 2003, claim 1 was amended to recite that the fluorine-containing resinous copolymer having functional group is crosslinkable as opposed to being crosslinked. Further, claims 2-4 were amended to recite that the copolymer is “resinous” for consistency with claim 1. Claims 5-10 were also added as new claims, directed to a resin composition comprising the crosslinkable fluorine-containing resinous copolymer having functional group and a curing agent that is reactive with the functional group of the copolymer.

In traversing the rejection, Appellants noted an apparent misunderstanding on the part of the Examiner with respect to the Comparative Example of EP '478. Specifically, Appellants pointed out that EP '478 is aimed at stabilizing a fluoropolymer against gel formation, which is caused by crosslinking. See, e.g., page 2, lines 3-4 and line 35, page 4, line 57 and page 5 lines 39-40. The occurrence of gel formation is determined by solubility in THF. Namely, the completion of crosslinking is determined by solubility in THF. See the Comparative Example and all Examples.

Therefore, EP '478 discloses two types of copolymers, that is, a copolymer which is soluble in THF and is not crosslinked (not gel formed), and a copolymer that is insoluble in THF and is crosslinked (gel formed). As previously pointed out by Appellants, the dry copolymer in the Comparative Example of EP '478 is completely insoluble in THF and therefore is a crosslinked copolymer. The inventive Examples of EP '478 provide copolymers that are soluble in THF and therefore are not crosslinked, fully consistent with the stated object of EP '478 of preventing gel formation of copolymers of ethyleneically unsaturated fluoro compounds. See page 2, lines 35-36. On the other hand, the copolymer of the present invention is insoluble in THF but is not yet gel formed or crosslinked. That is, the copolymer of the claimed invention is "crosslinkable" and therefore differs from the copolymer of EP '478 in this fundamental respect.

b. Claim 3

Although claim 3 is grouped separately from claims 1-2 and 4, claim 3 depends from independent claim 1 and is distinguished over the prior art for at least the same reasons as claim 1. Claim 3 is further distinguished over the prior art in view of the fact that claim 3 requires that

the copolymer additionally contain hexapropylene unit and ethylene unit as essential components. No such copolymer is disclosed by EP '478 and therefore EP '478 does not anticipate claim 3.

c. Claims 5-6 and 8-10

Although claims 5-6 and 8-10 are grouped separately from claims 1-2 and 4, independent claim 5 requires a fluorine-containing resinous copolymer having functional group as recited in claim 1 in addition to a curing agent that is reactive with the functional group of the copolymer. Thus, claims 5-6 and 8-10 are distinguished over the prior art for at least the same reasons as independent claim 1.

d. Claim 7

Claim 7 is grouped separately from claims 5-6 and 8-10, but requires the fluorine-containing resinous copolymer having functional group in addition to a curing agent that is reactive with the functional group of the copolymer as recited in claim 5 and is distinguished over the prior art for at least the same reasons as claim 5. Claim 7 additionally requires that the copolymer contain hexafluoropropylene unit and ethylene unit as essential components, which is not disclosed by EP '478. Therefore, Claim 7 is further distinguished over the prior art.

Thus, EP '478 fails to describe one or more of the elements of claims 1, 3, 5 and 7 and therefore does not anticipate the claimed invention.

2. EP '478 does not teach or suggest all elements of the claims and therefore the claimed invention is not rendered obvious over EP '478.

a. The Examiner has not established a *prima facie* case of obviousness.

In regard to the alternative rejection under 35 U.S.C. § 103, Appellants submit that the Examiner has not established a *prima facie* case of obviousness. EP' 478 does not disclose, teach or suggest a crosslinkable copolymer as required by the claims of the present invention, for the reasons discussed above. Therefore, one of ordinary skill in the art would have no reasonable expectation of success in achieving the presently claimed invention based on the disclosure of EP '478.

Further, although EP '478 discloses that the stabilized copolymers are particularly useful as components of high quality coatings and finishings (page 2, lines 4-5) and that in coating applications the coating composition is frequently applied from a solution in an organic solvent so that good solubility of such compounds and stability of the solutions is important (page 2, lines 3-17), there is no description in EP '478 as to a curing agent. Particularly, in the Comparative Example of EP '478, crosslinking is carried out without a curing agent.

More particularly, EP '478 does not mention or even recognize the technical merit of insolubility in THF. According to EP '478, THF is simply used to determine whether a certain copolymer is crosslinked. In the present invention, THF is employed to determine whether a crosslinkable copolymer has solvent resistance or not. Thus, one of ordinary skill in the art would not have had a reasonable expectation of success in achieving the claimed invention based

on the disclosure of EP '478 since EP '478 does not teach or mention the technical merits of insolubility in THF. Accordingly, EP '478 does not render obvious the presently claimed invention.

b. The Examiner has not provided a reasonable technical basis for relying on a theory of inherency for the missing elements of the claimed invention.

In the Office Action dated November 28, 2003, the Examiner took the position that the arguments based on the characteristics of the copolymer of being “crosslinkable” and “resinous” were not persuasive because the term “resinous” only defines the copolymer as having a high molecular weight and that the disclosed copolymer and composition of the Comparative Example of EP '478 would inherently possess the same characteristics. Further, the Examiner stated that EP '478 disclosed the use of azobisisobutyronitrile and methyl vinyl ether as curing agents and therefore took the position that crosslinking in the Comparative Example of EP '478 is carried out with a crosslinking agent.

In relying on a theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. & Inter. 1990).

As previously noted, EP '478 does not disclose a crosslinkable copolymer and therefore does not anticipate the claimed invention, either explicitly or under principles of inherency. A careful reading of the disclosure of the Comparative Example of EP '478 reveals that 4-hydroxybutyl vinyl ether, methyl vinyl ether and tetrafluoroethylene were polymerized (not

crosslinked) using azobisisobutyronitrile as a polymerization initiator. In this regard, Appellants point out that a crosslinking reaction is a reaction between polymers and is not equivalent to a polymerization reaction of monomers. Namely, there are different physical and chemical changes that occur in these different types of reactions.

Further, the polymer resulting from the polymerization reaction in the Comparative Example of EP '478 has a cure site at the end of the polymer due to the residue of azobisisobutyronitrile, but azobisisobutyronitrile does not act as a crosslinking agent. This is proven by the fact that while azobisisobutyronitrile was also used in Examples 1-3 of EP '478, the copolymers thus obtained were not crosslinked (gelled).

Even further, the claims require that the crosslinkable copolymer of the present invention must also be substantially insoluble in THF. Contrary to the claimed invention, the dry copolymer of the Comparative Example of EP '478 is insoluble in THF but is a crosslinked copolymer, different from the claimed crosslinkable resinous copolymer. According to EP '478, a compound that inhibits a crosslinking reaction (to thereby stabilize a polymer) such as triethylamine, is added in Examples 1-4, and the resulting polymers are soluble in THF. These results show that the polymers of Examples 1-4 and the polymer in the Comparative Example of EP '478, before being gelled, are all soluble in THF.

In view of the above, it does not follow that the crosslinked copolymer (gel formed) disclosed in the Comparative Example of EP '478 inherently possesses the properties and characteristics required by the present claims. Material elements of the claims cannot be ignored. Accordingly, the Examiner has not met the burden of proving a reasonable basis in fact

or technical reasoning to support a finding that the recited characteristics of the claimed invention are inherent in the prior art.

Thus, EP '478 does not disclose, teach or suggest, explicitly or inherently, all elements of the claimed invention. Therefore, the claimed invention is neither anticipated by, nor rendered obvious in view of EP '478.

- c. The terms “resinous” and “crosslinkable” as used in the claims describe physical properties of the claimed invention and should be given patentable weight.**

In maintaining this rejection in the final Office Action dated April 15, 2004, the Examiner did not accord patentable weight to certain terms describing the characteristics of the claimed composition such as “resinous” and “crosslinkable”. Further, the Examiner considered that the present claims do not define over the disclosure of EP '478 in which hydroxybutyl vinyl ether, methyl vinyl ether and TFE are polymerized as opposed to being crosslinked because the claims do not require any crosslinked components. The Examiner also inquired as to how the relationship between crosslinking characteristics and solubility in THF is determined.

The term “resinous” as understood by those of ordinary skill in the art is used as opposed to “elastomeric” or “rubbery” to indicate not only that the copolymer has a high molecular weight, but also that the copolymer is not an elastomer. Therefore, this term should be given patentable weight.

The term “crosslinkable” as employed in the claims also describes a distinguishing physical property of the claimed copolymer and composition. The term “crosslinkable” means

cable of being crosslinked (not yet gel formed) as opposed to crosslinked (gel formed), and should therefore be given patentable weight.

d. The arguments of record are commensurate in scope with the claimed invention.

In the Office Action dated April 15, 2004, the Examiner considered that the arguments regarding EP '478 in which hydroxybutyl vinyl ether, methyl vinyl ether and TFE are polymerized but not crosslinked, are not commensurate in scope with the claims (for the reason that the present claims do not require any crosslinked components). Appellants disagree. Appellants claim a "crosslinkable" copolymer and a composition comprising a "crosslinkable" copolymer substantially insoluble in THF, different from the crosslinked (gel formed) copolymer of the prior art and the crosslinkable copolymer of the prior art which is soluble in THF. Appellants' arguments are therefore fully commensurate in scope with the invention as claimed.

As to the Examiner's statement regarding the use of a curing agent in the Comparative Example of EP '478 and the Examiner's inquiry regarding the relationship between "crosslinkable" characteristics and insolubility in THF, these points have been fully addressed above.

E. Conclusion

Accordingly, it is respectfully submitted that the rejection under 35 U.S.C. § 102(b) or in the alternative under 35 U.S.C. § 103(a) over EP '478 is in error and should be reversed.

Appellants respectfully request the members of the Board to reverse the rejection of all the appealed claims and to find each of the claims allowable as defining subject matter which is neither anticipated nor obvious over the applied references.


APPEAL BRIEF UNDER 37 C.F.R. § 41.37
U.S. Appln. No.: 09/674,249

Attorney Docket No. Q61520

Unless a check is submitted herewith for the fee required under 37 C.F.R. §41.37 and 1.17(c), please charge said fee to Deposit Account No. 19-4880.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


Jennifer M. Hayes
Registration No. 40,641

SUGHRUE MION, PLLC
Telephone: (202) 293-7060
Facsimile: (202) 293-7860

WASHINGTON OFFICE

23373

CUSTOMER NUMBER

Date: September 15, 2004

CLAIMS APPENDIX



CLAIMS ON APPEAL

1. A fluorine-containing resinous copolymer having functional group, characterized in that the copolymer is crosslinkable, contains a hydrocarbon vinyl ether compound unit having functional group and tetrafluoroethylene unit, has a fluorine content of not less than 10% by weight and is insoluble in tetrahydrofuran substantially.
2. The fluorine-containing resinous copolymer having functional group of Claim 1, wherein a melting point of the copolymer is not more than 160°C.
3. The fluorine-containing resinous copolymer having functional group of Claim 1, wherein the copolymer contains tetrafluoroethylene unit, hexafluoropropylene unit and ethylene unit as essential components.
4. The fluorine-containing resinous copolymer having functional group of Claim 1, wherein the hydrocarbon vinyl ether compound unit is hydroxybutyl vinyl ether unit or glycidyl vinyl ether unit.
5. A resin composition comprising a crosslinkable fluorine-containing resinous copolymer having functional group and a curing agent which is reactive with the functional group of the copolymer, wherein said copolymer contains a hydrocarbon vinyl ether compound

unit having functional group and tetrafluoroethylene unit, has a fluorine content of not less than 10% by weight and is insoluble in tetrahydrofuran substantially.

6. The resin composition of Claim 5, wherein a melting point of the copolymer is not more than 160°C.

7. The resin composition of Claim 5, wherein the copolymer contains tetrafluoroethylene unit, hexafluoropropylene unit and ethylene unit as essential components.

8. The resin composition of Claim 5, wherein the hydrocarbon vinyl ether compound unit is hydroxybutyl vinyl ether unit or glycidyl vinyl ether unit.

9. The resin composition of Claim 5, wherein the composition is a resin composition for molding.

10. The resin composition of Claim 5, wherein the composition is a resin composition for coating.

EVIDENCE APPENDIX

Pursuant to 37 C.F.R. § 41.37(ix), submitted herewith are copies of any evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or any other evidence entered by the Examiner and relied upon by Appellant in the appeal.

NONE

RELATED PROCEEDINGS APPENDIX

Submitted herewith are copies of decisions rendered by a court or the Board in any proceeding identified about in Section II pursuant to 37 C.F.R. § 41.37(c)(1)(ii).

NONE.